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(71)(72) Applicant and Inventor: HANSON, Walter [AU/AU]; South Pacific Plaza, 157 Old Burleigh Rd., Broadbeach, QLD 4218 (AU).

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(54) Title: IMPROVED D.C. MOTOR

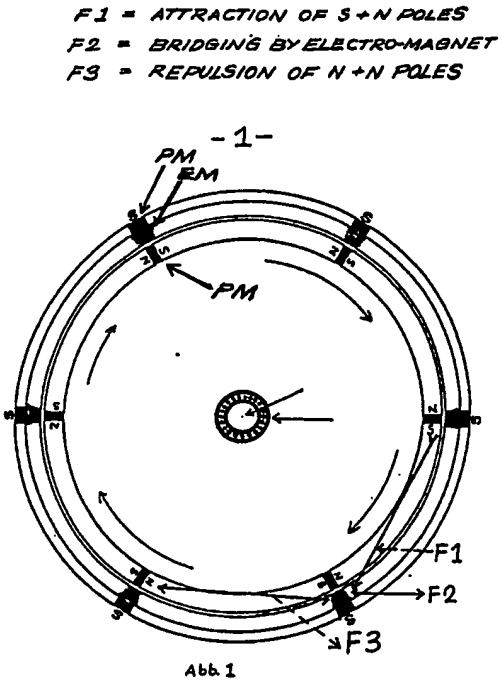

Abb. 1

(57) Abstract

An improved DC motor through the use of permanent-magnets on the rotor as well as on the stator combined with electro-magnets on said stator. The power of the attraction of north-south poles and the repulsion of the equal poles are utilized by bridging the two powers through direct current resulting in a saving of energy and the use of the three powers: attraction, bridging energy, and repulsion all three forces are working in the same direction.

* See back of page

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IMPROVED D.C. MOTOR

1.The object of this invention is to provide a more economical Direct Current Motor, that will give through the use of permanent-magnets on the rotor and a combination of permanent-magnets and electro-
5. magnets on the stator a better output than conventional D.C.Motors. It is well known, that the use of permanent-magnets in D.C.Motors have advantages in application in windcreen wiper motors for cars instead of copper windings of the stator in D.C.
10.Motors. The Novelty of this invention is, that the permanent-magnets of said rotor and said stator have both a force-field without needing any energy nor do they produce any heat, in this application it is possible to use the attraction of the opposite
15. poles of the permanent-magnets and the repulsion of the equal poles by adding a bridging force of Direct Current in form of an electro-magnet placed in front of the permanent-magnet of the stator. By utilising the Force F 1,= attraction, the
20. opposite poles, the Force F 2,= Bridging force provided by the electro-magnet in front of the Permanent-magnet of the stator, the Force F 3,= repulsion, through the equal poles of the permanent-magnets on the rotor and the stator as
25. indecated on drawing No.1.
The position of the permanent-magnets on the rotor shown on drawing No.2. is in between the two permanent-magnets of the stator being turned in the direction of the arrow by the attaction of

the north-pole of magnet A since the south-pole is facing it, while the north-pole of the permanent-magnet on the rotor is being repulsed by the north-pole of the stator magnet facing same.

The permanent-magnets on the rotor are placed in equal distances around the outside of the disc and have the same number of permanent-magnets on the stator. By this arrangement the full distance of the force-field between the permanent-magnets on the rotor and the permanent-magnets of the stator are being employed, the only energy needed is the Direct Current applied when the permanent-magnets of the rotor are opposite the electro-magnet of the stator which is backed by the permanent-magnet being part of the stator arrangement.

To fully understand the principle of the invention, I now decribe the invention supported by the drawings supplied.

To be able to utelize the increased power of the permanent-magnets of todays improved strength the benefit of a larger diameter is threefold.

Firstly, the number of magnets can be multiplied.

secondly,the leverage of the motor is greatly increased by the diameter of the rotor.

thirdly, since the energy only needs to be applied at the bridging point while the permanent-magnet of the rotor is opposite the electro-magnet of the stator, the degree of energy application is only half by twice the diameter of the rotor.

The energy consumption in ampere per hour is the same by higher output through more permanent-magnets on the rotor.

Since the permanent-magnets of the rotor are placed on the outer rim, the weight of those magnets is working like a flywheel, that will pull its own weight through the power of the permanent-magnets, the power 1- the attraction the power 2- the bridging energy pushing in the same direction and power 3- the repulsion all three forces are working in the same direction

In drawing No.3, three rotors are placed on one shaft with the magnets stepped in a way to have a constant push of equal force and a continual flow of the supplied energy through the electro-magnets on the stator.

Another prefered feature is a motor with one permanent-magnet less on the rotor than on the stator, having the effect to use only the energy for one electro-magnet at a time while all other rotor magnets are in between the magnets of the stator. A constant even thrust is the result of this single rotor motor.

The application for this economical D.C.MOTOR is in every field where D.C.MOTORS are applied today, like AIRCONDITIONING; PUMPS; MOTOR-CARS BOATS; AIR-CRAFTS; SPACE-CRAFTS; GENERATOR; BIKES and TRAINS:

The body of the rotor and the casing of the motor are of a non-magnetic material, a plastic injection mouldet or aluminum casting.

90. As in the drawing indecated the permanent-magnets are showing the magnetisation through S=Southpole, N=Northpole, PM=Permanent-magnet EM=Electro-magnet, NM=Non-magnetic-material.

The claims defining the invention are as follows:

Claim 1. A D.C.Motor with permanent-magnets combined with electro-magnets on the stator and permanent-magnets on the rotor, the rotor turning around a central shaft mounted on two or more points with bearings to turn freely around its centre. The permanent-magnets are placed on the outside of the rotor having the magnetised poles facing the direction of turn, and the stator-magnets facing towards the centre being placed behind the electro-magnets being kept in place by its moulded outside cover. The number of the rotor-magnets is the same as the number of magnets on the stator with its electro-magnets in front of the permanent-magnets. The rotor body being of a non-magnetic material not to interfear with the force-field of the magnets. see draing 1.

Claim 2. The apparatus of claim 1. With an enlarged diameter and an increased number of permanent-magnets the power output as well as the leaverage will be increased.

Claim 3. The apparatus decribed in claim 1 and 2 with the number of rotors encreased and placed on the shaft with equal spaces between the per-manent-magnets, so that the bridging-point is reached one after another to have a continoues energie-flow with a constant thrust.See drawing 3.

Claim 4. The apparatus of claim 1 and 2 with the number of magnets on the rotor one less than the number of magnets on the stator, in this case the rotor-magnets reach the bridging point of the electro-magnets in front of the permanent-magnets on the stator one after another to have even flow of energy. See drawing Nr.5.

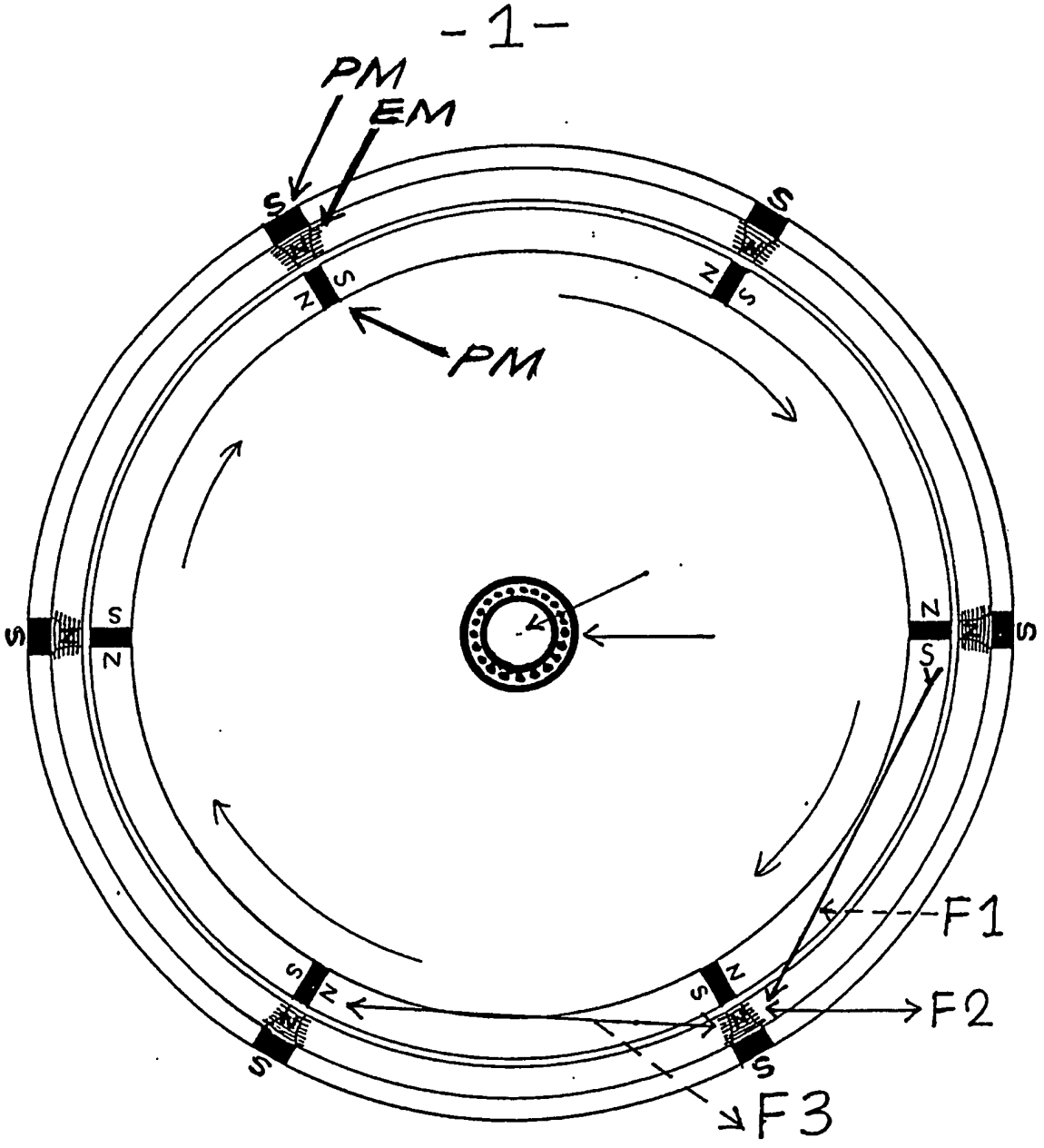
Claim 5. The apparatus decribed in claim 1, 2, 3, and 4, with the stator on the inside of the motor and the rotor on the outside of the same.

Claim 6. The apparatus described in claims 1, 2, 3, 4, and 5 with the poles of the permanent-magnets placed the opposite way to the way shown in drawing 5.

F1 = ATTRACTION OF S + N POLES

F2 = BRIDGING BY ELECTRO-MAGNET

F3 = REPULSION OF N + N POLES



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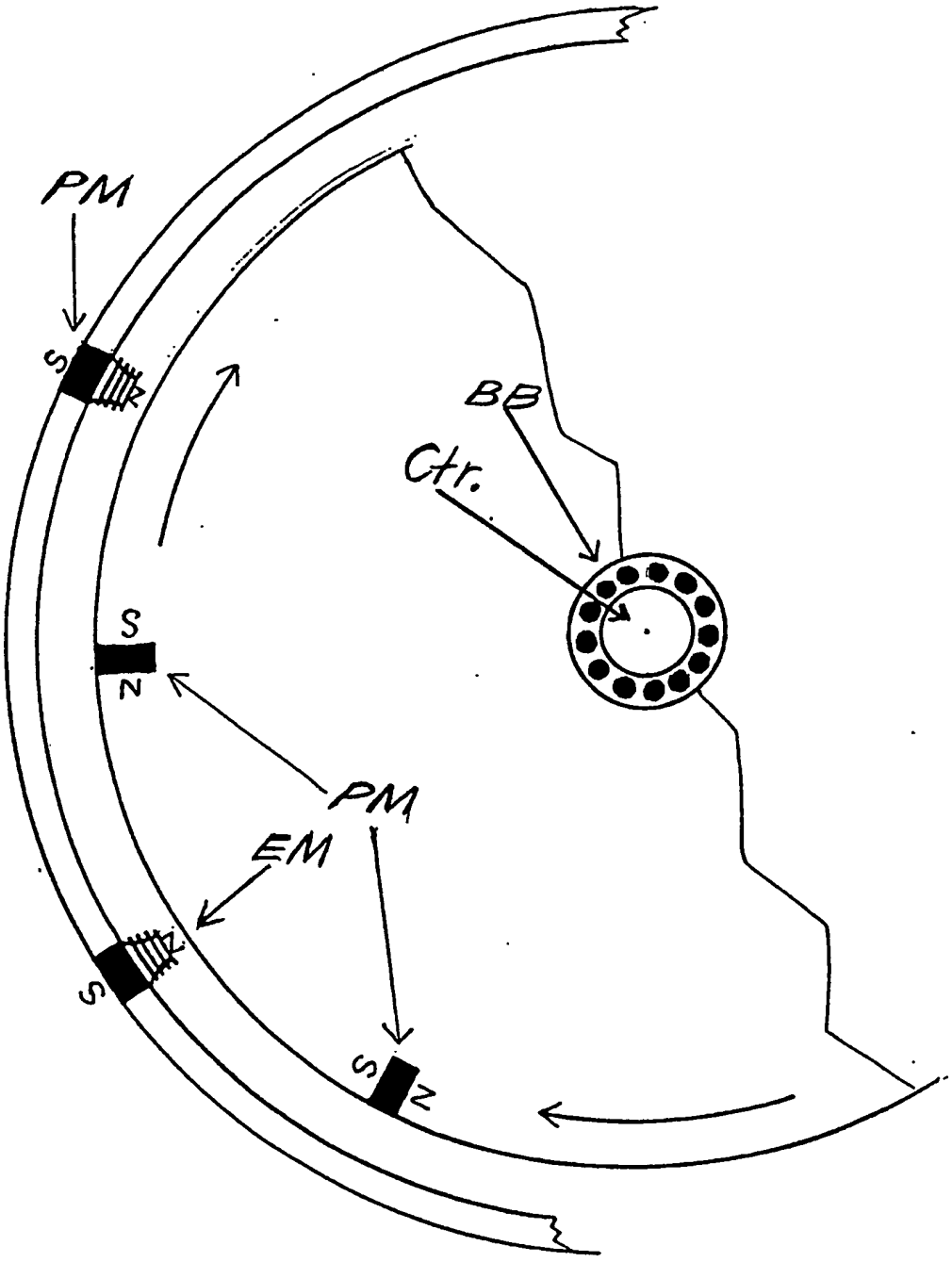

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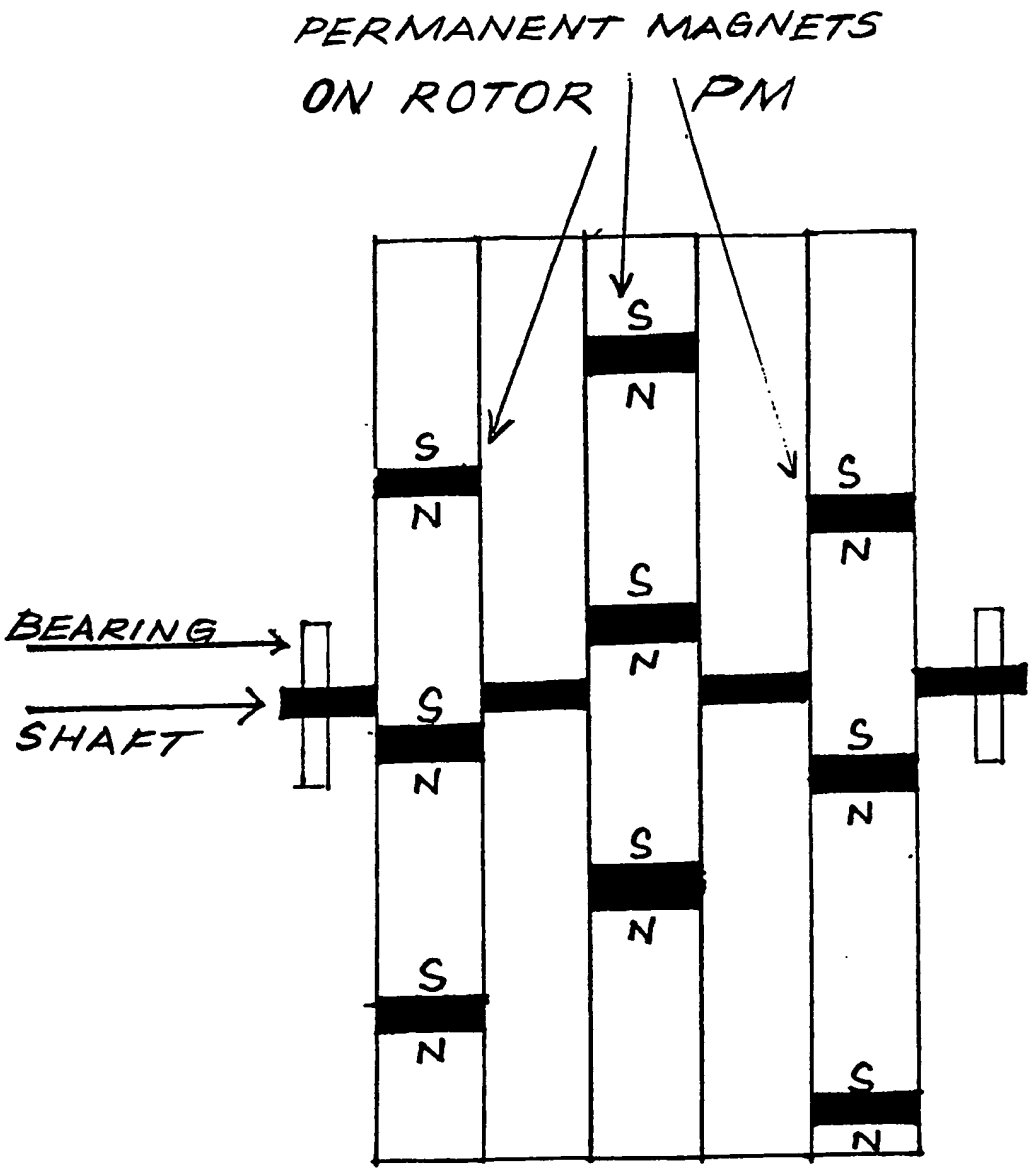

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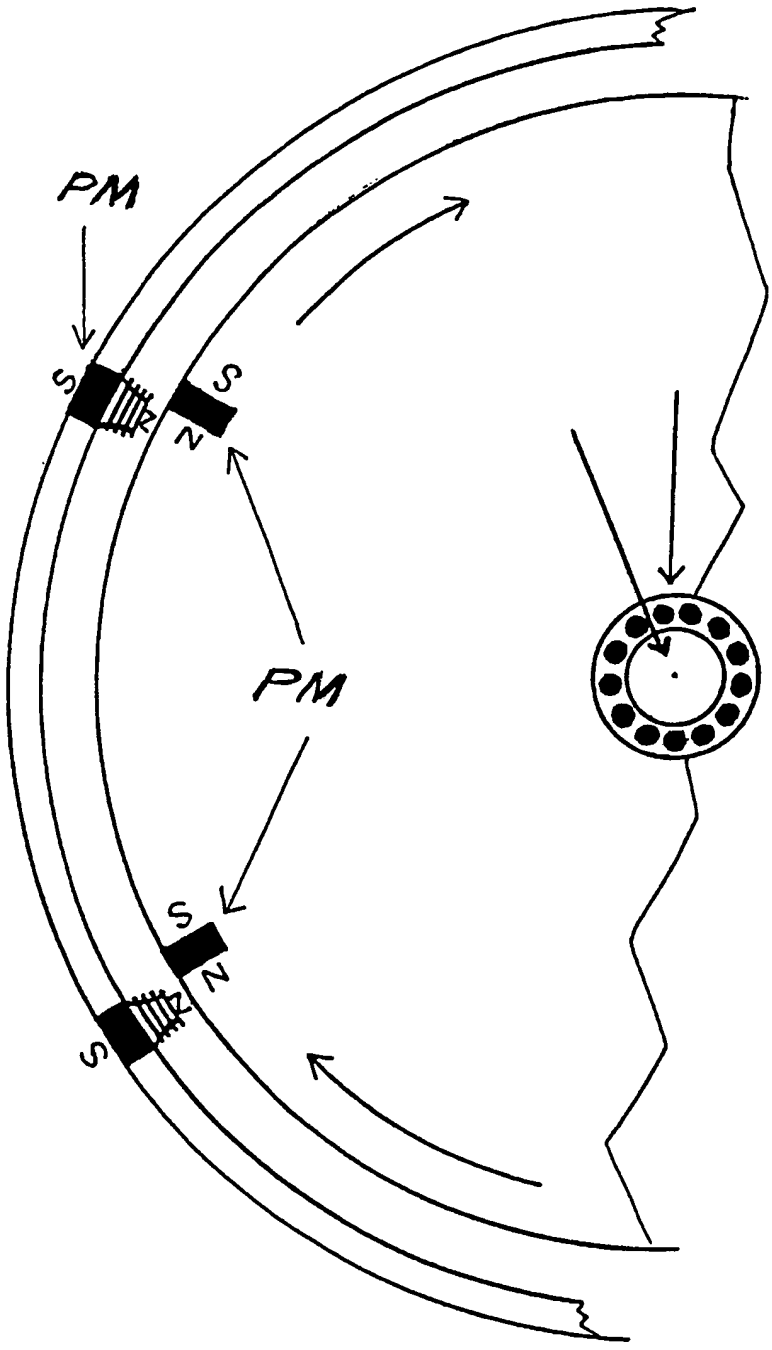
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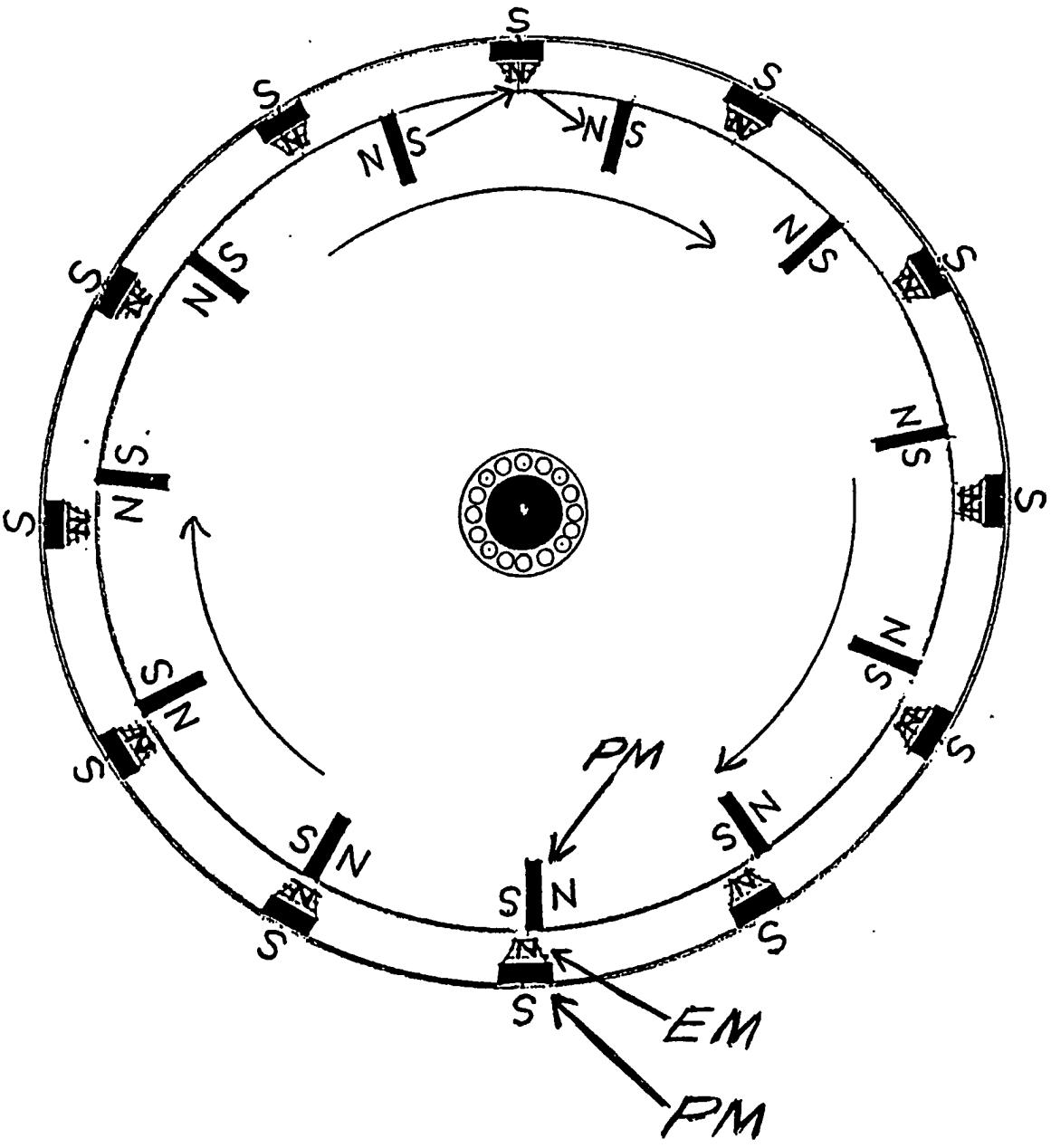
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INTERNATIONAL SEARCH REPORT

International Application No. PCT/AU 89/00393

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) 6

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl.[4] H02K 21/00, 21/04

II. FIELDS SEARCHED

Minimum Documentation Searched 7

Classification System	Classification Symbols
IPC	H02K 21/04

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched 8

AU: IPC as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT 9

Category*	Citation of Document, [11] with indication, where appropriate, of the relevant passages 12	Relevant to Claim No 13
A	AU,B, 31442/63 (274718) (INDIANA GENERAL CORPORATION) 10 December 1964 (10.12.64) See page 13 line 19 - page 15 line 14.	
A	US,A, 2816240 (ZIMMERMAN) 10 December 1957 (10.12.57) See column 3 line 69 - column 4 line 74	
A	US,A, 4417186 (HIROSE et al) 22 November 1983 (22.11.83) See column 1 line 51 - column 2 line 5	
A	US,A, 4571528 (McGEE et al) 18 February 1986 (18.02.86) See column 2 line 58 - column 3 line 10	
A	US,A, 4684855 (KALLOS) 4 Auguat 1987 (04.08.87) See column 2 lines 41-68	

continued

* Special categories of cited documents: 10

"A" document defining the general state of the art which is not considered to be of particular relevance

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
30 January 1990 (30.01.90)	16 FEB 1990
International Searching Authority	Signature of Authorized Officer
Australian Patent Office	N.C. PETERSEN

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

A	US,A, 4754207 (HEIDELBERG et al) 28 June 1988 (28.06.88) See column 4 line 26 - column 5 line 14	
A	US,A, 4774428 (KONECNY) 27 September 1988 (27.09.88) See column 2 line 54 - column 3 line 11	
A	US,A, 2907903 (REIJNST et al) 6 October 1959 (06.10.59) See whole document	
A	US,A, 4151431 (JOHNSON) 24 April 1979 (24.04.79) See whole document	

V. [] OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE 1

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.[] Claim numbers ..., because they relate to subject matter not required to be searched by this Authority, namely:

2.[] Claim numbers ..., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.[] Claim numbers ..., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4 (a):

VI. [] OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING 2

This International Searching Authority found multiple inventions in this international application as follows:

1.[] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2.[] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3.[] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4.[] As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

[] The additional search fees were accompanied by applicant's protest.

[] No protest accompanied the payment of additional search fees.

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON
INTERNATIONAL APPLICATION NO. PCT/AU 89/00393

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Members		
US 4417186	JP 57116144	AT 106/82	CH 654151
	DE 3200664	FR 2498026	GB 2091948
US 4571528	AU 29583/84	BR 8403040	CA 1218402
	EP 130048	EP 130048	IN 162792
	JP 60016181	SU 1321382	ZA 8404717
US 4684855	AU 39667/85	EP 183710	GB 8505997
	GB 2156602	WO 8504269	WO 8504269
US 4754207	DE 3414312	EP 159005	JP 60234453
US 4774428	EP 291219	JP 63294243	

END OF ANNEX